IN THE CLAIMS:

Please cancel Claims 1 - 7 without prejudice, as being to a non-elected invention.. Please amend Claims 8, 21, 23, and 27 as follows.

Claims not being amended are presented in italics for reference purposes only.

8. (Once Amended) A method of producing a combined barrier layer and wetting layer structure [useful] which is used in combination with a conductive layer, said method comprising the steps of:

a) depositing a first layer of TaN_x having a thickness ranging from greater than about 10 Å to about 1,000 Å; [and]

A2

b) depositing a second layer of Ta having a thickness ranging from about 5 Å to about 500 Å; and

c) depositing a conductive layer over a surface of said second layer of Ta, wherein the substrate temperature during said conductive layer deposition and in subsequent processing steps is less than about 500 °C .

9. (Once Amended) The method of Claim 8, wherein [the] said conductive layer is copper.

10. The method of Claim 8, wherein said first layer of TaN_x is deposited upon a substrate having a substrate temperature ranging from about 25 °C to about 500 °C.

11. The method of Claim 8, wherein said second layer of Ta is deposited upon a substrate having a substrate temperature ranging from about 25 °C to about 500 °C.

GWB1 12. (Once Amended) The method of Claim 8, wherein said barrier layer is used in an interconnect structure, and wherein the thickness of said TaN_x layer ranges from about 50 Å to about 1,000 Å and the thickness of said Ta layer ranges from about 20 Å to about 500 Å.

A3

13. (Once Amended) The method of Claim 8, wherein said combined barrier layer and wetting layer structure is used in a contact via structure, and wherein the thickness of said TaN_x layer ranges from about 10 Å to about 300 Å and the thickness of said Ta layer ranges from about 5 Å to about 300 Å.

14. The method of Claim 8, or Claim 12, or Claim 13, where x ranges from about 0.1 to about 1.5.

15. The method of Claim 8, wherein at least a portion of said Ta layer is deposited using a traditional, standard sputtering technique.

16. The method of Claim 12, wherein at least a portion of said Ta layer is deposited using a traditional, standard sputtering technique.

A4 17. (Once Amended) The method of Claim 8, wherein at least a portion of [the] said TaN_x layer is deposited using a traditional, standard sputtering technique.

18. The method of Claim 8, wherein at least a portion of said Ta layer is deposited using ion-deposition sputtering.

19. The method of Claim 13, wherein at least a portion of said Ta layer is deposited using ion-deposition sputtering.

20. (Once Amended) The method of Claim 8, wherein at least a portion of [the] said TaN_x layer is deposited using ion-deposition sputtering.

21. (Once Amended) A method of producing a copper interconnect structure comprising [the] a combined TaN_x/Ta barrier layer and wetting layer, [of Claim 1] and an overlying copper layer, wherein the Cu [{111}] <111> crystallographic content of said overlying copper layer is at least 70 % of the Cu [{111}] <111> crystallographic content which can be obtained by depositing said copper layer [using] over a pure Ta barrier layer which is about 500 Å thick, said method comprising the steps of:

A5

a) depositing a first layer of TaN_x having a thickness ranging from greater than about 50 Å to about 1,000 Å;

b) depositing a second layer of Ta having a thickness ranging from about 5 Å to about 500 Å over the surface of said first layer of TaN_x ; and

c) depositing a third layer of copper over the surface of said second layer of Ta, wherein at least a portion of said third layer of copper is deposited using a physical vapor deposition technique, and wherein the substrate temperature at which said third layer of copper is deposited is less than about 500°C.

22. The method of Claim 21, wherein said copper interconnect structure is annealed at a temperature of less than about 500 °C.

23. (Once Amended) A method of producing a copper-comprising contact via structure comprising [the] a combined TaN_x/Ta barrier layer and wetting layer, [of Claim 1] and an overlying copper layer, wherein the Cu [{111}] < 111 > crystallographic content of said overlying copper layer is at least 70 % of the Cu {111} crystallographic content which can be obtained by depositing said copper

A6

layer [using] over a pure Ta barrier layer which is about 300 Å thick, said method comprising the steps of:

a) depositing a first layer of TaN_x having a thickness ranging from greater than about 10 Å to about 300 Å;

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b) depositing a second layer of Ta having a thickness ranging from about 5 Å to about 300 Å over the surface of said first layer of TaN_x ; and

c) depositing a third layer of copper over the surface of said second layer of Ta, wherein at least a portion of said third layer of copper is deposited using a physical vapor deposition technique, and wherein the substrate temperature at which said third layer of copper is deposited is less than about 500°C.

24. The method of Claim 23, wherein said contact-comprising structure is annealed at a temperature of less than about 500 °C.

25. The method of Claim 23, wherein said copper layer is deposited at a temperature of less than about 300 °C.

26. The method of Claim 25, wherein said structure is annealed at a temperature of less than about 500 °C.

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27. (Once Amended) A method of producing a copper-comprising contact structure comprising [the] a combined TaN/Ta barrier layer and wetting layer, [of Claim 1] and an overlying copper layer, wherein the Cu [{111}] <111> crystallographic content of said overlying copper layer is at least 70 % of the Cu [{111}] <111> crystallographic content which can be obtained by depositing

said copper layer [using] over a pure Ta barrier layer which is about 300 Å thick, said method comprising the steps of:

a) depositing a first layer of TaN_x having a thickness ranging from greater than about 10 Å to about 300 Å;

A7 Cont'd

b) depositing a second layer of Ta having a thickness ranging from about 5 Å to about 300 Å over the surface of said first layer of TaN_x ; and

c) depositing a third layer of copper over the surface of said second layer of Ta, wherein at least a portion of said third layer of copper is deposited using a physical vapor deposition technique, and wherein the substrate temperature at which said third layer of copper is deposited is less than about 500°C,

wherein at least a portion of said first layer, or said second layer, or said third layer, or a portion of a combination of said layers [thereof], is deposited using ion-deposition sputtering.

REMARKS

Applicants hereby confirm the election of Group II, Claims 8 - 27, made in view of a restriction requirement, during a telephone conversation between Examiner Jason Resnick of Art Unit No. 1775 and the undersigned attorney of record on August 5, 1999. The Group I claims, Claims 1 - 7 are canceled herein, without prejudice, as being non-elected claims under the restriction requirement. Prosecution of Claims 1 - 7 will be pursued in a subsequently filed divisional application.

The Specification has been amended to include a portion of the invention which was disclosed in independent Claims 21, 23, and 27 at the time of the application was originally filed. In particular, the subject matter of independent Claims 21, 23, and 27 from the originally-filed application has been inserted into the Summary of the Invention. Applicants may, as a matter of right, subsequently add to the Specification (Summary of Invention) the subject matter which was disclosed in originally filed Claims 21 - 27.